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FRONT COVER: *Girl wearing printed Paisley twill dress of pure 'Terylene'*

OUR CONTRIBUTORS

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J. R. WHINFIELD is the inventor of 'Terylene' and a member of the 'Terylene' Council. If you want to know more about him, turn to page 52.

SULPHUR INTO ACID

Some Impressions of a Vital Chemical in the Making

By D. W. F. Hardie (General Chemicals Division)

For close on a hundred years sulphuric acid—the most important chemical of all for industry—has been made at the sites of the Marsh and Wigg Works of General Chemicals Division. Here is the story of its making, with sketches by Arthur Horowicz.

THE often-quoted dictum of Justus von Liebig, that the prosperity of a country might be gauged from its consumption of sulphuric acid, has not now the validity it had in 1841. Taken literally, it would place the United Kingdom seventh among the industrial nations and rank the United States second only to Belgium, which consumes about 95 tons for every 1000 of population as compared with 79 tons in the United States.

PYRITES—BURNING KILNS, 100 ft. *long, at Marsh Works. Known as Lurgi Burners, they burn iron pyrites in a stream of air to produce sulphur dioxide.*

The consumption pattern is considerably distorted by the very great importance of sulphuric acid as a raw material in the fertilizer industry in predominantly agricultural countries. Australia, for example, has a "sulphuric acid index" approximating to that of America. In Britain over a quarter of the acid produced goes to fertilizer manufacture, the largest acid-consuming industry. Next in importance is production of rayon yarn and transparent paper, which consumes about one-eighth of the acid produced. The principal use in the rayon industry is for coagulating the viscose into a solid filament.

Pigment and paint manufacture requires large tonnages of the acid for the production of "permanent white" (barium sulphate) and in making titanium white. Metal-pickling, i.e. the removal of oxide scale from ferrous metals, is another large user; some 100,000 tons of acid are now annually consumed for this purpose in Britain.

Also among the biggest acid consumers is the chemical industry itself. The making of chemicals such as dyestuffs, explosives and detergents requires very large tonnages, and petroleum refining has become an increasingly important customer for acid. In 1926 about 14,000 tons 100% sulphuric acid were taken by British refineries. After the last war demand rose steeply, and in 1951 over 67,000 tons went to our oil industry.

It would be quite impossible even to indicate here the variety of industries in this country consuming the comparatively small quantity of around 1000 tons each per annum. A vast range of familiar things in everyday use have at some stage in their manufacture involved the use of this ubiquitous acid, which as its liquid corrosive self is seldom seen by the man in the street (the man in the car may, if he is curious, see it in his battery).

Merseyside manufacture

On Merseyside the manufacture of sulphuric acid has been long established. Several small works for making "oil of vitriol," as sulphuric acid used to be called, were in operation in Liverpool over 150 years ago. But it was not until 1823 that the first lead chambers of modern size were erected there. They were installed by James Muspratt to make the large quantities of acid he required to manufacture soda by the Leblanc process.

In the half-century that followed, the Widnes and Runcorn area near Liverpool became one of the principal heavy chemical manufacturing regions of the world. Enormous tonnages of sulphuric acid were made, chiefly as a raw material for soda. Today General Chemicals Division continues this century-old tradition.

Much of the long history of sulphuric acid technology has been tied up with problems associated with its sources of raw material. There are four principal raw materials:

(i) *Sulphur or brimstone.* The needs of the acid makers used to be entirely met by sulphur from Sicily and

STOCK SHED AT WIGG WORKS. *Sulphur-containing raw materials are handled mechanically here on a large scale.*

several other Mediterranean countries until in 1838 an imprudent King of Naples repudiated a commercial treaty with this country and bestowed a monopoly of Sicilian sulphur on a firm in Marseilles. Incidentally, the King of the Two Sicilies was soon persuaded by threat of a British naval blockade to reconsider his obligations. Nowadays the great sulphur deposits in Louisiana and the Texas Gulf make the United States the chief brimstone producer.

(ii) *The sulphur-containing mineral, iron pyrites.* The first imports of pyrites came from Wicklow in Ireland. Later Spain became (and remains) the principal producer of pyrites.

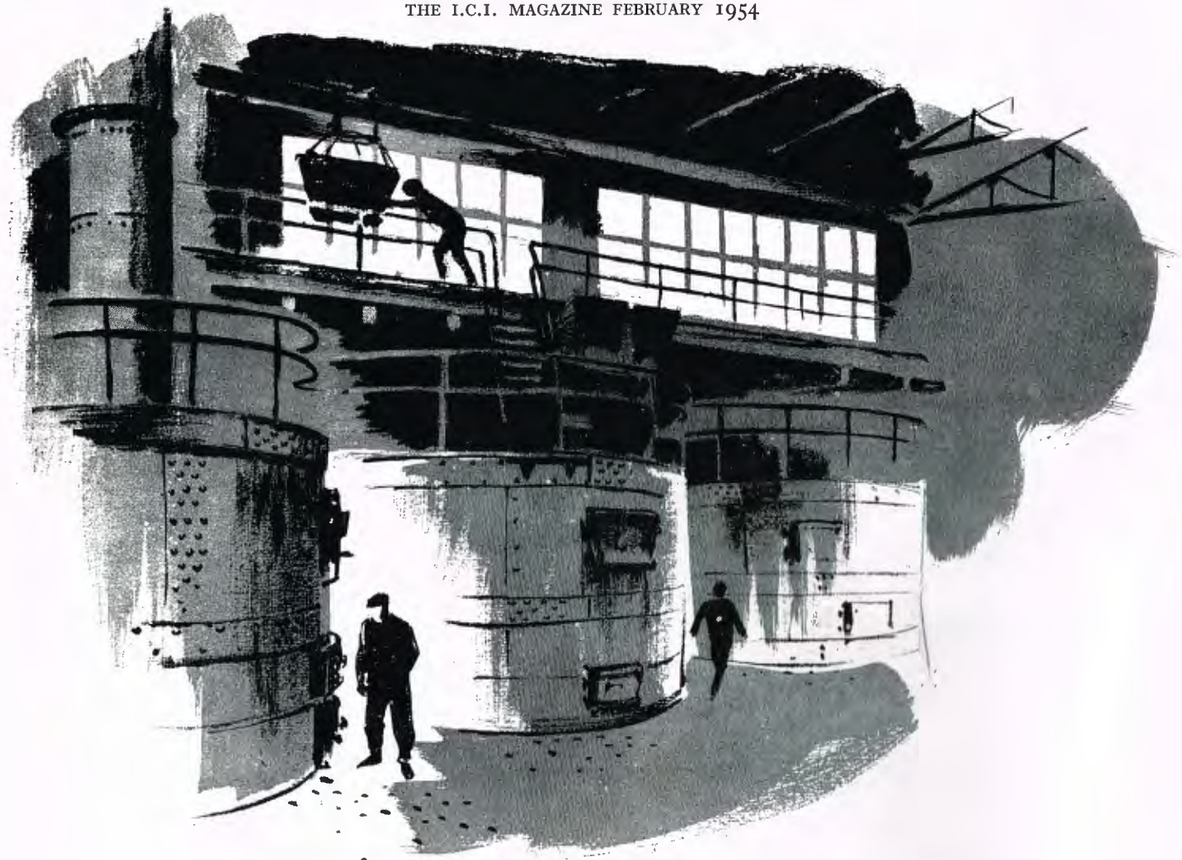
(iii) *Spent oxide from coal gas purification.* This first began to be used as a sulphur source in about 1870. It contains up to 50% of free sulphur and is produced as a waste material in very large tonnages by gas works.

(iv) *Anhydrite.* This mineral, a form of calcium sulphate, has only been used as a source of sulphur for acid manufacture in the present century.

So much for the sources of raw material. Now comes the question: How is sulphuric acid made? Perhaps this is best understood if we go back 200 years.

At Birmingham in 1746 the versatile Dr. John Roebuck (later to be the founder of the famous Carron Iron Co. and sponsor of Watt's steam engine) erected a sulphuric acid plant, using sheet lead. Roebuck's lead chambers, which were six-foot cubes with the lead supported by an

A page from the artist's sketch book



SULPHUR BURNERS OF THE HERRESHOFF TYPE, *in which the raw materials are roasted to yield sulphur dioxide—the first stage in the manufacture of sulphuric acid*

external frame of wood, were the prototype of the chambers still in use. Later chambers were in some cases as large as the average concert hall.

The process Roebuck used was extremely simple. Water covered the bottom of the lead chamber, and a mixture of nitre and brimstone was burned in an iron dish supported above the water. The nitre, while supplying the oxygen to burn the brimstone to sulphur dioxide, was also the source of the nitrogen oxides which cause sulphur dioxide to undergo further oxidation to trioxide. The sulphur trioxide was slowly absorbed by the water to give sulphuric acid.

Batch after batch of nitre/brimstone mixture had to be burned before the acid approached usable strength, four to six weeks being frequently required for this purpose.

Early in the nineteenth century this primitive process was improved. Brimstone was roasted in a separate furnace to give sulphur dioxide, and the nitre was heated in a series of pots so as to yield up its catalytic nitrogen oxides to the stream of sulphur dioxide passing into the chambers. A draught drawn through the chambers promoted movement of the sulphur dioxide and air, accelerating their interaction.

Removing deposits from burner flues

But before long there was to be a fundamental turning point in the technique of manufacture. In 1831 a Bristol vinegar merchant called Peregrine Phillips was granted a patent for a method of making sulphuric acid without lead chambers. Phillips made use of the property of platinum to cause sulphur dioxide to react with the oxygen of the air to give sulphur trioxide.

Phillips' process had to wait almost half a century before it made an entry into practical acid manufacture. Methods of

purifying the large quantities of sulphur dioxide gas from the roasting furnaces and of controlling the temperature of large masses of platinum catalyst had to be developed before an industrial process could be worked.

Today this process, which replaces large lead chambers by comparatively small converters containing layers of catalyst, is universally known as the contact process. Various metallic compounds are now used as catalysts, and these continue to be active for a period of years.

Generally several converters work in series, partial reaction taking place in the first and being brought to practical completion in a second and, perhaps, third or fourth converter. By a heat-exchanging device, heat liberated by the reaction in the second converter is used to raise the temperature of the air and of the sulphur dioxide mixture entering the first converter. Reaction takes place at temperatures between 400° and 600° C.

Advantages of the contact process are several, but the most important is that it produces the sulphur trioxide as such, and this is dissolved in already strong acid to produce still stronger. Before the advent of the contact process, strong sulphuric acid had to be made by distilling off water from chamber acid to produce "rectified oil of vitriol," a procedure still commemorated in the use of the commercial term "R.O.V."

The technological history of sulphuric acid has for the past forty years been dominated by a gradual transition from the chamber to the contact process of production. In 1941, production of the acid by General Chemicals Division was approximately equally divided between the two processes; today, almost three-quarters of the output comes from contact plants.

General Chemicals Division operates contact plants at Widnes, Runcorn and Oldbury, and chamber plants at Widnes, Wednesbury and Oldbury, those at the two last-named sites being of the modern (Mills-Packard) conical water-cooled type. Only the chamber plants at Gaskell-Marsh Works, where acid production began in 1855, are now of the old type.

CONVERTERS AT MARSH WORKS, *in which sulphur dioxide gas is oxidised catalytically to sulphur trioxide by the contact process*

Apart from the massiveness of its components, a sulphuric acid plant lacks the spectacular character of many modern chemical factories.

Perhaps the most impressive parts of the plant at Marsh Works are the 100-foot-long, slowly rotating, sloping kilns in which iron pyrites is roasted. Reaction between the sulphur in the pyrites and the air current is so energetic that the mineral reaches red heat and combustion is self-maintaining.

Today every industrial country manufactures most of its own requirements of the acid (about a quarter of the acid produced in Britain is made by I.C.I.); and the "oyle" which John Roebuck made by the hundredweight in his lead boxes in Steelhouse Lane, Birmingham, 200 years ago plays a part in world economy to the extent of twenty-five million tons a year.

Information Notes

THE NEW COMPETITION

By John Rogers (former Chairman of I.C.I.)

"The whole concept of competition has altered," said Mr. John Rogers in his recent Gluckstein Memorial Lecture to the Royal Institute of Chemistry. Here is a short extract from his lecture in which the former Chairman of I.C.I. reflects on the changed competitive conditions of today.

THE title "Commercial Aspects of the Chemical Industry" is not used by me as an excuse to bring forward statistics and detailed figures. Neither do I wish to speak at any length on the importance of competitive manufacture and the wickedness or harmful nature of certain forms of monopoly.

On those matters much has happened since my early days in industry. At one time public speakers and writers frequently condemned those business and financial methods of procuring control over manufactures and trading that resulted in "sweating" the public by raising prices and delayed the adoption of advanced and up-to-date methods.

Scarcely anything of that kind is heard of or printed today in criticism of the chemical industry. Attention now is directed more towards the power large concerns possess, and the fear is sometimes expressed that in certain circumstances such strength might be used against the interests of the public.

I do not wish to be thought in favour of monopolies merely as monopolies, nor do I wish you to think it possible that I could be well disposed to senseless competition simply because it lowers sale prices, for the time being at any rate. In these days competition among reputable firms in the chemical industry does not manifest itself in that way, and I myself hold strongly that there are no disreputable concerns engaged in that industry.

The Customer's Influence

The whole concept of competition has altered. The customer is the important person, and it is essential to please and encourage him, not by the old methods of getting business by price adjustments, accompanied, as they very frequently were, by bribery, backhanders, presents and the like.

Today it is necessary and profitable for the manufacturer to make friends of customers by seeing to it that the main points of his policy are to offer quality and service, and to ask a price consistent with a reasonable profit. Generally the customer is well aware that he must have such a profit to carry on his own business and improve his own output.

I recollect a sales transaction that to me had an amusing result. It was one of the old-time efforts, in which friendship between a salesman and his customer was all-important.

In Canada the sales manager of the Hamilton Powder Company had secured a very good and lucrative contract from a friend who was manager of a mining firm. The seller invited the purchaser to dine in Montreal. At dinner, the former asked for the wine list and said "Bill, we must have champagne," and Bill said "One moment, George: who pays for this dinner?" So George said "In the first instance I do. In the second instance the Hamilton Powder Company does, and in the third you do, and like hell too." Canadian frankness!

Sales to Industry

Our industry is one in which a great number of sales are made from one firm to another, and frequently the factory products do not reach the public directly but are refabricated or used in the production of other materials and ultimately sold to the consumer through retailers. Agents and retailers are very useful in keeping the bulk producers on their toes and ensuring that their prices are competitive.

As suppliers to other industries the chemical firms are frequently called upon to help the ultimate exporter in competition abroad by reducing the prices of supplies. From the point of view of the exporter this is an attractive call, but he is often difficult to satisfy, particularly if the original manufacturer is working efficiently and had already adjusted his sale price to allow only a reasonable profit.

This country is sometimes at a disadvantage because it is necessary to import raw materials that are not produced or producible here. Our position is particularly difficult when it

is desired to export to those countries that themselves produce the raw materials.

We are all keenly aware how important it is to export to dollar countries, the U.S.A., of course, being the biggest market—theoretically. Now and then one observes statements to the effect that if we could secure 1% or thereabouts of the U.S.A. home market it would be sufficient to give us a favourable balance, and the natural reaction is that this should not be, or does not appear to be, very difficult to achieve.

It is not quite so simple. If, for instance, we attempted this with a few kinds of chemicals and had considerable success, our American counterparts would raise much disturbance and lobby in Washington to get tariffs raised to prevent importation. On the other hand, if the 1% were attempted in a very wide range of chemicals, sales costs would be very high—at times prohibitive.

It is of course essential to bear in mind the needs of the public of the importing country and submit materials to them in the form they wish to have them, which may be very different from the goods popular in this country. I do not say this as an excuse for not exporting, but merely because these factors must be taken into account when manufacturers are considering special products for export.

Competition and Co-operation

Perhaps the most important commercial aspect of any industry is competition. At first sight competition would appear to be merely a position in which a few people or firms find themselves supplying or trying to supply the public with the same or very similar things. It is not nearly as simple as that today.

The competitive spirit must be in the minds of all those engaged in manufacture; in fact, Competition has come to mean Co-operation—within the factory and the offices, and frequently, too, with the customers. Lowering the sale price of a raw material, though this is generally appreciated and gratefully accepted by the user, is not everything; such action may be necessitated by too much competition of the old kind and may quite frequently be accompanied by a lowering of quality.

It is essential to study the needs of the customer, which involves to some extent studying his processes. This type of co-operation is advancing rapidly in our industry, and I have known many occasions when the supplier and consumer have disclosed an extraordinary amount of information to each other, much to their mutual benefit.

At one time chemical and many other works made a great feature of secrecy, which was taken to lengths that today would be considered ludicrous. When I started as a chemist in a certain factory a new laboratory had been built, and I was supposed to give my attention to research in that building. The works manager told me that everything I did had to be kept secret and that I could not allow any of my fellow chemists to enter the laboratory. Also on no account could I consult in any circumstances with any colleague. The only person outside this ban was the chief chemist. Well, that did not last very long!

The great difficulty in trying to help a customer is his fear that he may be giving his supplier information that might possibly be useful to a competitor.

While speaking of frankness and laying open knowledge to suppliers and, in a way, to competitors, I would add that there is a good deal of misunderstanding about American methods and habits in such matters. It is true that many American manufacturers are extremely open in what they show to visitors. Probably we were, and perhaps we still are, somewhat backward in this matter, but let me say this—the Americans are just as careful as anybody in this country to keep important research work secret until they feel the time has arrived when it would be suitable and profitable for disclosures to be made.

In helping customers with technical service, experimental work is very frequently undertaken. This will undoubtedly reduce the customer's consumption of the substance or thing sold him by the firm supplying this service. One might say: "Why spend money in helping a customer to buy less from you?" In my experience it does not work out that way, for generally it enables the user to expand his business to compensate for that. It should be remembered that it is better business to help your customer than to sit and wait for some competitor to do it.

Salesmen and Scientists

You may imagine that I am advocating a situation where the good salesman is not required, and where his place can be taken by any chemist or scientist. That is, of course, nonsense and will be so for as long as buying and selling are done by human beings. I hasten to say I am not one of those who regard chemists and other scientists as beyond the human pale—although I have heard questions raised on the matter in view of their opinions on some subjects.

A very great number of scientists are able, and frequently willing, to go into spheres where the financial reward appears greater. Why not? They are human beings. Some of them have been known to become good salesmen and general managers.

In these days it is essential to use technically trained people as, and with, salesmen to give proper service to customers. The infiltration of the chemist into the sales arena enables him to see to it that service work is not divorced from the plants where production takes place. It is important that the works chemist should be alive to the uses of his product and should be acquainted with the complaints of consumers and, if desirable, visit them, so keeping his interest keen.

Such a policy has another advantage; it very often provides a feeder for research.

A GUIDE TO THE CHEMICAL INDUSTRY

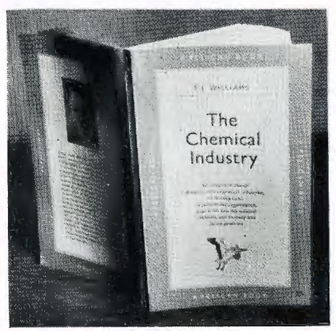
The Chemical Industry (*Pelican Book, 2s.*), *by Trevor Williams, Deputy Editor of* Endeavour, *is here reviewed by Dr. R. E. Slade, former I.C.I. Research Controller.*

A STORY is told of a prince who, many centuries ago, inherited a great library. He instructed his wise men to make for him a summary of the knowledge revealed in the books so that he might read and learn. After many years they produced a summary which could be carried by twelve camels. He then asked them to make a more condensed summary. They reduced it to three camel loads. He then asked them to reduce it further. They reduced it to one sentence: "Be good."

Trevor Williams has had almost as great a task as those wise men. He has condensed into 192 pages *The Chemical Industry*. He has reviewed the past, the present and the future and made it into a very readable book for anyone who is interested in the science or the industry of chemistry.

In Part I (The Past), he deals with our knowledge of the earliest phases of the industry in Egypt and regrets that we know little of the earlier industry which no doubt existed in ancient China.

He then deals with the Industrial Revolution and the chemical industries which arose therefrom, most of them in this country. He deals particularly with the alkali, sulphuric acid and the natural and synthetic carbon compounds, and concludes this part of his review with the development of the industry in the first world war.



In Part II (The Present) he deals with the modern chemical industry in Britain. Excluding the compounding of chemicals to make such products as paints, insecticides, sheep and cattle dips, and pharmaceutical preparations, the industry produced in 1948 some 9,000,000 tons of chemicals. But with the works under construction it was planning to produce 14,250,000 tons. The annual turnover (sales) of the industry in 1948 was £337m. and the turnover on the completion of all development schemes was expected to be £609m.

The amount of capital invested in the industry is probably nearly £500m. and 160,000 people are employed, so the invested capital is about £3000 per employee.

Part III (The Future) is a short chapter in which he speculates on the future of the industry. His conclusions are: "Undoubtedly in the future it [the chemical industry] will achieve results as remarkable, but today as apparently unattainable, as transmutation was to the alchemists. Whatever these new achievements may be, we can be certain that they will ultimately be reflected, directly or indirectly, in daily life."

Since the theme covers so large a field the stories of two or three branches of the chemical industry have to be unfolded at one opening of the book, but the narrative flows freely and the book is very readable. It contains no chemical formulae.

There are many thousands of us who have played a part in the development of the chemical industry. To us it brings back memories of ideas and suggestions brought forward years ago —some to be scrapped at once, others to be worked at for months, if not years, and then finally dropped; but some, after much striving, to become the new industries which he describes. It reminds us too of the blood and sweat expended in building new plants and starting them up. And of the friends we made when pumps did not pump, cocks would not shut off and vessels overflowed—generally between midnight and dawn.

'TERYLENE' IN INDUSTRY

(Contributed by 'Terylene' Council)

Because of its special properties—six of them are listed below—'Terylene' provides the best-yet answer to not a few industrial problems. Here is an authoritative survey of the potentialities of 'Terylene' in the industrial field.

BECAUSE of a remarkable combination of properties, both chemical and physical, not found together in any other synthetic fibre, 'Terylene' has much to offer industry. This is a vast field of application by no means yet fully explored. It is, however, safe to say that in many cases 'Terylene' can contribute to a substantial reduction in costs, and in some instances it can make entirely new processes possible.

The special properties of this fibre can be summed up as follows.

Exceptional Strength. This quality of strength is not limited to plain load-carrying: the fibre stands up well to abrasion, flexing and stretching, which makes it particularly suitable for such uses as tyre cords, belting, hosepiping and sack threads.

Withstands Heating. 'Terylene' melts at a higher temperature than other commercial synthetic fibres, and even after prolonged heating its properties remain substantially unchanged. A recent experiment showed that after being heated for 168 hours at 50° C. 'Terylene' lost only 20% of its initial strength.

Absorbs Very Little Moisture. Because of this, 'Terylene' dries very quickly and does not swell when wet. Most other synthetic fibres lose strength when wet—some very markedly —but not so 'Terylene.' With a moisture take-up of less than 0·5%, its strength when wet is only a little less than when dry.

Good Insulation. 'Terylene' has a lot to offer in electrical work, particularly when the requirement is for an insulating material not only efficient under conditions of high temperature but also light and thin. 'Terylene' is already being used as lapping for fine wires and in fabric form for insulating small high-power electric motors. The exploration of potentialities in this field is only just beginning.

Chemically Very Inert. 'Terylene' stands up to strong acids like sulphuric and hydrochloric and also to oxidising agents in the most concentrated form. It is unaffected by most alkalis when cold and breaks down with strong alkalis only when heated. Chemical and dyestuffs manufacturers consider 'Terylene' leads the field for filtration purposes, and in laundry work it is particularly sought after for bags and covers, since it is unaffected by bleaching agents.

Exceptionally Durable. 'Terylene' is not affected by mildew or by bacteria, and moreover it is not inflammable. It stands up to light much better than most other fibres and is not adversely affected by sunlight, particularly through glass. This makes 'Terylene' most suitable for curtains, awnings and deck covers.

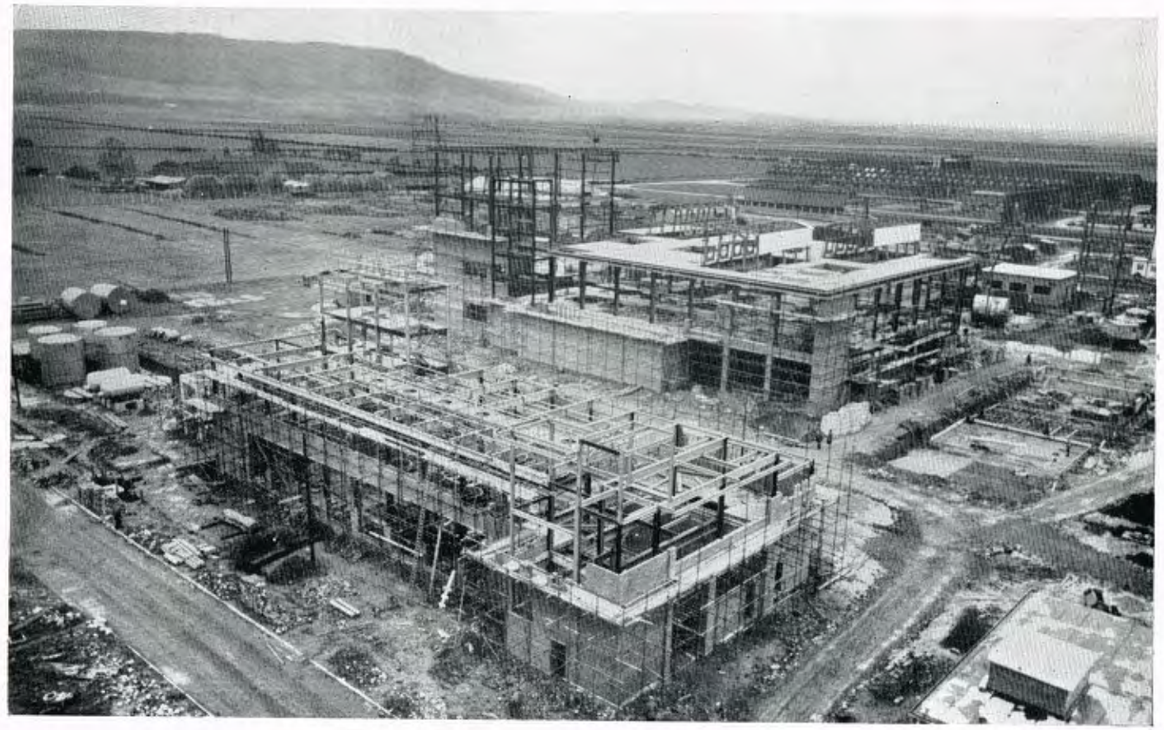
It is not possible here to do more than give an inkling of some of the fields of use which are now being explored with the comparatively small weight of 'Terylene' available, but a few examples will serve to show how 'Terylene' is already at work in industry. Most of the trials now being conducted are on a long-term basis, and a considerable time must elapse before all the information is at hand and before all the uses are proven.

The potential applications for the fibre are, however, extremely varied. The uses under test include protective clothing and overalls required to resist acids, industrial gloves required to resist heat, boat covers, railway wagon canopies, tarpaulins, tyre cords, motor-car hoods, brakes, hoses, belts for driving motors and fans, flexible hoses for discharging oil from tankers, fishing nets (a particularly promising and important application), whaling ropes, laundry bag and press covers, hospital blankets, and industrial sewing thread for sacks and papermakers' felts.

Because of Terylene's strength and resistance to abrasion and flexing, conveyor belts are already being used by Lime Division; and Dyestuffs Division is testing out 'Terylene' dye-bags which promise to have a long life in resisting absorbing liquids from the dyebath.

This is by no means a complete list of all the trials now in progress, but it does serve to illustrate the great versatility of 'Terylene' and gives an indication of the future of this fibre.

Meanwhile rapid progress has been made at Wilton in north Yorkshire in the construction of the new 'Terylene' factory already covering some thirty acres. The plant will consist of machinery specially designed by I.C.I. engineers for producing both the 'Terylene' polymer and the final products of filament yarn and staple fibre. It will begin with an annual production of some eleven million pounds early in 1955 and a year later will double this output.



The new 'Terylene' plant under construction at Wilton

With Haaf* Net on the Solway

By Harry Hutchison (Nobel Division)

In the Solway estuary on the Scottish border an unusual form of salmon fishing is practised with traditions going back to Scandinavian customs derived from the Norse invasions of the eighth to tenth centuries. Here is an account of a day's catch at the hands of a foreman in Nobel Division's Powfoot factory.

WHEN I met Joe Thorburn in the centre of Annan he slapped the great canvas bag which was slung over his shoulder. "I hope it's not so empty when we come home," he remarked. "We'd better hurry, because the tide will be right in about half an hour."

FIXING THEIR WADERS *are Joe Thorburn, foreman in Powfoot Factory, and W. McCracken, Powfoot processman*

Three miles from Annan along the Carlisle road we turned our bicycles into a farm lane and made for the banks of the estuary. The excursion had been arranged to catch the ebb tide at the right point, because Joe was going out with his haaf net to demonstrate for me a traditional, exciting and sometimes profitable art.

"There'll be a trout or two, but it's salmon that pays," he explained as we dismounted at a neat house on the shore.

Joe is a spare foreman in Powfoot Factory, which lies along the Solway Firth. He is good at another job too. Men of his family have been skilful with the haaf net for generations. The craft is unique to the Solway and legal under certain carefully observed conditions. Much knowledge of treacherous sands and changing watercourse, understanding of the ways of sea-trout and salmon, sensitive hands, strong arms, keen eyes and optimism are the qualities which bring success.

There was only a slight breeze, and although the sky was grey the clouds rode high. That was good, because if there had been the slightest threat of Scotch mist Joe would not have fished that day. To be caught and lost in a mist on Solway sands sets the heart of a brave man pounding. It is about as bad as being trapped in quicksands, and that danger, always present, must be guarded against.

There was no threat of mist that dove-grey day. Already other men could be seen out on the vast exposed sands fishing with the haaf net from both Scottish and English shores.

* Haaf is Norwegian for sea

CARRYING THE CUMBROUS EQUIPMENT—17 *ft. wide—over the Solway sands to the fishing ground*

"Any fish today?" Joe asked the occupant of the house by the shore. "In there," said his friend, and nodded to the door of an outhouse. On the wet concrete floor lay half a dozen salmon and about three dozen sea-trout.

"From the stake-nets," Joe explained. "We'll see them on the way out. But I'd better hurry—I can see they're killing fish out there."

Two miles away out on the flat shining dun sands a row of black ovals could be seen like buoys on the water. Now and again one of the patches moved quickly as though to beat a carpet. These were the haaf net men fishing in a syndicate. Before they had taken up position that morning they had cast the mell, or drawn lots in an ancient drill derived from old Scandinavian custom.

Joe took his waders from a rope and put them on; excellent waders which cost him about twelve guineas early in the season. Over them he put coarse socks, and on top he tied goloshes firmly and most carefully. "These save the feet of the waders; but they've got to be secure, or else . . ."

The waders were chin high, because, as I was to learn later, the haaf-man goes into three or four feet of water.

"Come on!" said Joe. "Now for the net, and I'm ready to start."

That net surprised me. It resembled a long, narrow water-polo goal with a crossbar seventeen feet long. At each end and from the middle were sticks about a yard long. Projecting upwards from the crosspiece was a central handle of stout wood. The outfit was completed with a voluminous trailing net fixed round the crosspiece and drawn tight across the bottom of the structure. Thus an enormous net pocket was formed. All this had cost Joe about £5.

Joe hoisted the cumbrous structure easily on his shoulder and walked to the sands. His walk was steady: cautious but certain. I followed.

As we went over the sands we passed the stake nets which run from the shore to a point far out. These fixed nets baffle and beguile salmon seeking their way towards fresh water at high tide. As fish strike the net barrier they move towards the deep channel and attempt to force their way upstream again, only to strike the barrier once more. At the end of it all is a cunning maze of nets into which the salmon and sea trout are guided and bemused until they are in a trap from which in their agitation they cannot escape. When the tide ebbs, the stake nets and the trap are left high and dry.

Below the level of these stake nets the haaf net men can

fish the ebb and flow, but as soon as water comes to the stakes again they must stop. All this and further complications of an old tradition which is permitted by law were explained as we made our way to the channel Joe proposed to fish.

We were now walking slowly over a strangely luminous expanse of sand detached from both shore and sea. A quarter of a mile ahead the estuary of the Solway lay exposed at low tide. The channel cut in sand changed slightly as we approached, and at its edges little inch-high cliffs of sand would collapse into the stream.

Underfoot the texture of the sand was oddly resilient. "Don't stand too long in one place," said Joe. "It's all right here, but it changes. Last week the river was over there, nearer the English shore. I'm going in now."

He pointed the net downwards and probed the bottom carefully. By moving into the channel cautiously and using the net as a sounding device the presence of holes "big enough to hold houses" can be detected in time, but the process does not reveal quicksands. Only experienced feet can probe these treacheries.

Three or four times he turned back because underfoot the sand was not firm, then twenty minutes later he found a good place and moved forward deliberately into the channel. As he probed ahead with his net and tested with his feet he varied course. Once or twice he shouted the explanation—"Soft sand !" At last when he was in mid-channel and in about four feet of water he called out "This will do !"

THE SALMON HAS JUST BEEN CAUGHT *and will soon go in the bag*

The current flowed smoothly yet quickly on the ebb, and he studied the slight ripples and eddies on the surface before planting his haaf net in position where it made a seventeen-foot-long gate across the river at its most interesting part.

"The fish," he explained, "will try to get up there and finding too little water will come back here, or so I hope."

In position Joe held the framework against the current which then drew the net past his legs and downstream.

"Now I'm fixed I'll have a smoke," he shouted, and took his cap from his head. In it were his cigarettes and matches safe in "the only dry place." That over, he rested his hands on the crosspiece and gathered in some net on his fingers. Then he waited, seemingly patient but in fact scanning the surface of the water. "There's fish about, all right," he announced. "Look at that !" It was a swift, darting ripple on the surface. "A salmon," said Joe. "Something'll happen soon."

"Soon" was twenty minutes later. The man, nearly chest-deep in the flow of the stream, was leaning on his net without movement. Then as though shocked by some subterranean current he was galvanised. His hands jerked at the net and simultaneously he raised the structure as though it were a huge frying pan. He dragged the trailing net in, twisting it as it came. I saw a flash of frenzied living silver in the tail of the net. Joe took the fish from the net, killed it, and held it up for me to see. "Sea-trout," was his cheerful message. "About three pounds."

He opened his great waterproof canvas bag and dropped the first of his catch in. There were more fish in the channel. Three or four times in the next half-hour he repeated the procedure, and each time another sea-trout went into the bag. Save for these frenzied interruptions the process was calm and immobile.

Then without warning I saw Joe stagger backwards and his net swing. "Did you see that ?" he shouted. "It was a big salmon ! It hit my outer stick and escaped just like a football hitting the post and going for a bye." He pointed downstream and showed me the ripple caused by the escaping salmon.

He came out for a moment or two to share sandwiches and beer. We talked of salmon and quicksands, and he told me how badly he felt one night when he fished too long and too far out towards the English side. The tide made on him and a slight mist confused the long road home. "I had to wade chest-deep, and I was scared that the water would rise and flood my waders. That's bad for a haaf net man."

RETURNING HOME *when the tide rises, with a catch of one 12 lb. salmon and a dozen sea-trout*

Before going in again he asked to be told quickly when the time was five to three.

"You're doing well," I remarked. "Don't stop early because of me."

"That's nothing to do with it," he assured me. "At five to three the tide'll be making and we'll just get to the shore in time."

Back he went to the channel and settled to a profitable session. Four more sea-trout came his way, but he wanted a salmon now. He was not very optimistic, but "you never know."

It was Joe's good day. I saw him jerk and brace himself, and two yards or so behind the water was lashed and churned. In the foam was lusty quicksilver. He had to pull hard and fast. "Salmon ! Salmon !" he cried jubilantly as he fought the net in. He stunned the fish with a blow from a small wooden baton, then killed it. As he held it up for me to admire before putting it in the bag, he guessed the weight at twelve pounds. The time was now 2.30 p.m. and he had been fishing for close on three hours.

"Are you cold ?" I shouted. "Catching salmon isn't cold work !" he shouted back.

He caught no more salmon, but excluding a lively sea-trout which escaped the net he caught three more nice fellows of between two and three and a half pounds in weight.

"Is it five to three yet ?" he questioned. "Yes !" I shouted.

He lifted his net, hitched his now heavy bag round his shoulders, and made slow progress to the shore.

"You've brought me luck today," he said when he reached firm sand. "Twelve sea-trout and a nice salmon. It's a good job you saw it all. Nice fishing with a haaf net, eh ? Easier than the fly !"

I agreed it was much easier if you know how like Joe.

'Terylene' in the Home

By J. R. Whinfield ('Terylene' Council)

What is it that makes people excited at the mere mention of 'Terylene'? What boons will 'Terylene' bring us? Here is an authoritative summing up, telling you the 'Terylene' clothes likely to be found in the shops when the Wilton plant comes into production at the end of this year.

Colour photographs by Elspeth Juda

It is now almost nine years since the first bobbin of 'Terylene' yarn was made by I.C.I.—nine years in which a great deal has been achieved in planning full-scale production and establishing the future of Britain's new textile fibre. Production has grown from the laboratory through experimental and pilot plant stages; and now the opening of a great new plant, ultimately to have an annual output of some 20 million pounds, is eagerly awaited. This is therefore perhaps just the right time to study the fields in which we can expect 'Terylene' to be used in the future and to estimate its value in terms of what it will mean and offer to all of us.

First of all, do not run away with the idea that 'Terylene' is to be the complete answer to all our clothing and furnishing problems and that as more 'Terylene' becomes available so practically everything that we wear will be made from it. In fact, the plan is to manufacture 'Terylene' only for those purposes for which it is best suited.

Nearly all the limited output from the existing pilot plant has been devoted solely to establishing the best uses for the fibre—uses which really reflect the good things about 'Terylene.' This has entailed obtaining the co-operation of the textile industry and many other industries too, and the thorough testing of yarns and fabrics in the laboratory. Wearer trials have been in progress, seeing just how long, for instance, a pair of socks can be worn, how shirts react to continual wear and washing, how cardigans, suits and skirts perform. These trials have helped form a picture of the potential success of the various applications.

Soft, warm and resilient socks; delicate lingerie and nightdresses; hard-wearing, crease-resistant suits—these are just a few of the garments you can expect to be made from 'Terylene,' and they give an idea of the versatility of this new fibre.

One of the reasons why so many things can be made from 'Terylene' is that it is produced in two distinct forms, making it suitable for a very wide variety of applications. The first of these is called *filament yarn*, which is a fine, continuous thread produced in various thicknesses or deniers and is like silk. It can be used to make a great number of beautiful fabrics such as voiles, marquisettes, brocades, satins and velvets, and garments like summer-weight underwear, shirts, dresses, blouses and ties. The other variety is known as *staple fibre*, which is short, crimped (or waved) lengths produced for spinning in the same way as wool or cotton are spun. 'Terylene' staple fibre is a soft, resilient material which will be worn in the form of suits, slacks, skirts, socks, and warm, winter-weight underwear.

'Terylene' is easy to look after and needs little care and upkeep. 'Terylene' underwear, shirts, dresses—in fact all garments made from the filament yarn—are quickly washed and quickly dried. They do not shrink in the washtub, and if tight wringing is avoided they seldom need ironing. Nobody should mind laundering their 'Terylene'; clean clothes can be available every day of the week with the minimum of trouble.

What is more, there is little trouble attached to the storing or packing of 'Terylene' fabrics and garments, for this new fibre is certainly not a food for moths. So those who wear 'Terylene' need never worry about moth damage or about the expense and inconvenience which go with sprays and odorous repellents.

'Terylene' is a tough fibre, too, and even its flimsiest fabrics such as voiles and curtain marquisettes, although

Paisley-printed twill dress of pure 'Terylene

appearing dainty and fragile, are amazingly strong. What is more, the strength of 'Terylene' remains when the garment is wet or dry, which means that, unlike many other textiles, it is not likely to be damaged in the wash-tub.

When you see 'Terylene' displayed in the store you will notice that it looks good; and when you handle it on the counter you will notice too that it feels good. In fact, warmth and pleasantness of handle are offered by 'Terylene' alone among synthetic fabrics. It is a property which means added comfort and pleasure in wear as well as a feel of good quality.

Suits made from the natural fibres such as wool very often lose their shapes and good looks long before they become worn out, and the lighter the fabric the more apparent the damage. With 'Terylene' it is different. A suit well made from this new fibre has the great quality of retaining the shape the tailor gave it and not bagging untidily at knees and elbows. Likewise a 'Terylene' skirt will strongly resist stretching.

Suit made by Charles Creed from pure 'Terylene' hopsack suiting

'Terylene' is very obliging with its creases, for it rejects those which are untidy and unwanted and retains those which we like to keep. You can wear and pack your suits, slacks and skirts without worry if they are made from 'Terylene.' Crush marks, and sleeve, knee and seat creases just spring out and your garments are fresh again. But, on the other hand, if you put in your trouser crease or skirt pleat with an ordinary hot iron or a Hoffman (tailor's) press, it is there to stay, and even wetting and washing will not disturb it. It will remain through all normal wear, and it will take another iron to remove it.

For men, 'Terylene' is already available in small quantities in the form of underwear, shirts, ties and socks. Men can also expect before long suits and sports trousers made either from 100% 'Terylene' staple fibre or from 'Terylene' blended with other fibres.

Ladies can buy piece goods for lingerie (and 'Terylene' sewing thread to make them up), nightdresses, underwear, summer dresses, blouses, gloves and knitting yarns. They can expect, too, to see soon 'Terylene' staple fibre in the form of lightweight suits, slacks and skirts.

Looking to the future, there seems to be no doubt that before long we shall all have worn 'Terylene' or have bought it for our homes. It is a textile offering many unique advantages, and soon it will be here for us all.

Nightdress and négligée of pure 'Terylene'

Portrait of the month—6

(Photograph by Charles Wormald, The Kynoch Press Studio)

J. R. WHINFIELD

JOHN REX WHINFIELD, inventor of the new fibre 'Terylene,' is no mere backroom boy, immersed in a narrow world of test-tubes and abstract thought. He is also an expert on textiles and a businessman who has travelled the world, from India to Canada, for the 'Terylene' Council.

The interest in synthetic fibres which led Whinfield to the invention of 'Terylene' sprang from his early association with Cross, who with Bevan had invented viscose rayon at the end of the last century. Thus there is a link between these two British man-made fibres, of which one has had a profound effect on the world's living standards, while the other is already pointing the way to hitherto undreamed-of standards.

After his association with Cross at the end of the first world war Whinfield spent the next twenty years in Lancashire on textile work. He was in charge of research at the Broad Oak works of the Calico Printers Association when, pursuing with his assistant J. T. Dickson a line of research on fibre-forming polymers, he discovered the new polyester fibre eventually christened by him 'Terylene' from the fibre's chemical name polyethylene terephthalate.

Rex Whinfield is the last man to oversimplify research work, but it is fair to say that his laboratory investigations were carried out with apparatus costing, he estimates, about half a crown. With such simple apparatus the first crude samples were made. When Whinfield found that the sticky mess with which he was experimenting turned to solid at about 260° C. he was excited. When the new fibre was compared with nylon, obtained by shaving bristles from a toothbrush, he realised that he had made a major discovery.

And what of the man? A Londoner born, he learned his science at Merchant Taylors' School and Cambridge University. He has a frank and open manner, which might disconcert his hearers but for the sincerity and good humour which never desert him.

I.C.I. NEWS

I.C.I. TIE: LION-AND-STRIPES DESIGN WINS

THE I.C.I. tie will have a design of yellow lions on a maroon ground, with white wavy stripes: that is the result of the competition launched in the December issue of the *Magazine*.

The three prizes of £10, £5 and £3 go respectively to Mr. P. N. T. Tibbitt (Research Dept., Plastics Division, Welwyn), Mr. G. E. Beasley (Works Laboratory, Paints Division, Slough), and Mr. J. K. M. Weir (Standardising Dept., Dyestuffs Division, Grangemouth). Theirs were the first three entries opened of the 34 that forecast correctly the preference of the majority.

Of the 11,885 entries received 3700 put the winning design (labelled D on the page of possible designs) first. Design H (yellow lions on a plain maroon ground) polled the second largest number of votes—a clear indication of an overwhelming preference for a maroon-coloured tie. The majority preference for all eight possible designs was as follows:

A	B	C	D	E	F	G	H
5	7	6	1	8	4	3	2

Although lady competitors do not appear among the prize-winners, there were three ladies among the 31 entrants who forecast the result correctly but were unlucky enough not to win a prize. Better luck next time to the unlucky 31!

Ties on Sale in the Spring

The winning design is already in the hands of the manufacturers, and some ties will be on sale by April, with further quantities following soon after. As already announced, the tie is to be woven in 'Terylene'; the cost, and the arrangements made in works and offices to put the tie on sale, will be announced as soon as possible. Prospective buyers are urged to order as soon as these arrangements are made known if they wish to be high up on the delivery list.

Central Labour Department, which organised the competition and was responsible for sorting the results, reports as follows:

Seen through the red and watering eyes of those who ran it, the I.C.I. Tie Competition is liable to give distorted vision. Nevertheless "Operation Strangler," as we dubbed it early on in the proceedings, did reveal some startling facts and vital statistics which we feel bound to pass on.

Our knowledge of the Company's geography has been brushed up, enlarged, and brought right up to date. We had to exert almost Sherlock Holmsian powers of detection to ferret out some locations. We now know that "Dets" are at Ardeer; that Roskear is at Tuckingmill; that "Growing Department" is at Fernhurst; that UF/WF is at Wilton; that "the Mine" is at Winsford, but "the Mine" is also at Billingham; and that there are some John Thompson boilers at Billingham. Of these "untraceable" entries only one defeated us in the end.

There were 105 spoiled papers and 210 late entries. There were entries from boardrooms, from workshops, from farms and laboratories and from national service men. There were entries from Egypt, Holland, Sweden and China (although unfortunately these had to be disqualified in accordance with the rules). And competitors entered from craft at sea and from the Isle of Skye.

Some people sent us their Christmas wishes, and a few others their date of birth. We even received some call-up papers, a stores requisition, and a pay chit (but not the pay packet!), and one man asked for a bow-tie version of the tie for formal wear.

Winning design for the I.C.I. tie. The lions are yellow on a maroon ground, the stripes white.

How to keep the Lion on its Feet

The most useful suggestion was from a member of Billingham's Synthonia Club. Before the war the club had a tie whose design included white lions, and the writer remembers the difficulty club members had in getting the lion on the knot of the tie to stand on its feet—more often it stood on its head or laid on its back. The remedy, he claims, lies in making the first throw-over, when tying the tie, from *right* to *left* rather than *left to right*: this makes it possible for the lion to stand on its legs—which is, as he points out, a much more dignified position.

Mr. T. W. Painter

Mr. E. Wilson

NEW YEAR HONOURS

FOUR I.C.I. directors and three workers received awards in the New Year Honours List.

They were Mr. Stephen France Burman, M.B.E., a non-executive director of the I.C.I. Board, who received the C.B.E.; Mr. Daniel McVey, C.M.G., a non-executive director of I.C.I.A.N.Z., who received the K.B.; Col. Sir T. Ellis Robins, D.S.O., a non-executive director of A.E. & C.I., who received the K.B.E.; Mr. St. J. de H. Elstub, Wrought Production Director of Metals Division, who received the C.B.E.; Mr. T. McCall, Ardeer Factory, Nobel Division, Mr. T. W. Painter, Waunarlwydd Works, Metals Division, and Mr. E. Wilson, Prudhoe Factory, Billingham Division, all received the British Empire Medal.

Mr. Burman was appointed to the I.C.I. Board last year. He is well known in Birmingham for his work for the local hospitals, and he is vice-chairman of the Board of Governors of the United Birmingham Hospitals.

Mr. McVey has been on the board of I.C.I.A.N.Z. since 1947. He is also managing director of Metal Manufactures Ltd., in which company I.C.I.A.N.Z. participates. He is a native of Falkirk, Scotland, and during a life of public service has been the leading delegate for Australia at many Commonwealth communications conferences.

Col. Sir T. Ellis Robins, as well as being a director of A.E. & C.I., is a prominent figure in many other South African and Rhodesian enterprises. He was chairman of the Rhodes Centenary Exhibition held in Bulawayo last year, which was attended by the Queen Mother and Princess Margaret.

Mr. Elstub joined the engineering staff of I.C.I. Billingham Division in 1936. During the war he was seconded from operational duties with the R.A.F. to the Ministry of Supply as armaments officer to carry out design work on new weapons. On demobilisation he became superintendent of rocket design at a Ministry of Supply establishment, later being promoted to chief engineer and deputy chief superintendent. He rejoined I.C.I. in 1947, became chief engineer of the Metals Division in 1949 and was appointed to the Division board in 1951.

Mr. McCall is well known in I.C.I. as chairman of the workers' representatives at Central Council, a position he held almost without a break from November 1948 to May 1953.

He joined I.C.I. in 1938 and is now a checker in the distribution department at Ardeer Factory. He served in the army during the first world war and for fifteen years worked in Glasgow Transport Department, where his interest in trade unionism developed.

Mr. Painter joined Kynoch Ltd. at Birmingham in 1919 and has since amassed 35 years' experience of the rolling of non-ferrous metals. As a senior foreman he went to Waunarlwydd Works when it was first built, and it was largely through his skill in helping to train labour there that production advanced so rapidly.

Mr. Wilson, ammonia maintenance foreman at Prudhoe, started his career as a fitter on the construction of No. 2 Ammonia Works at Billingham in 1923. He was transferred to maintenance just before the first ammonia was made in 1923. He spent the war years at Dowlais and has been at Prudhoe since 1944.

MAGAZINE CIRCULATION
A NEW RECORD

The circulation of the *I.C.I. Magazine* has now reached 69,000—an increase of more than 5% over the figure for the same time last year, when the circulation was 64,500.

The figures for the last three Januaries are:

January 1952	62,000
January 1953	64,500
January 1954	69,000

I.C.I. BOARD

Dr. Fleck for N.C.B. Enquiry

The National Coal Board has announced that Dr. Alexander Fleck, Chairman of I.C.I., is one of five men from industry and the trade unions who have agreed to assist in the board's enquiry into their organisation.

Sir Ewart Smith

Sir Ewart Smith, Technical Director of I.C.I., has been appointed deputy chairman of the British Productivity Council. He succeeds Sir Lincoln Evans, who was appointed vice-chairman of the Iron and Steel Board last year and resigned from the Council when he relinquished the appointment of general secretary of the Iron and Steel Trades Confederation.

The new chairman of the British Productivity Council is Mr. Tom Williamson, general secretary of the National Union of General and Municipal Workers.

HEAD OFFICE

Mr. C. W. James Retires

Mr. C. W. James, who during his 38 years' service had been in Nobel Division, Dyestuffs Division, Metals Division and Head Office, retired at the end of the year.

Mr. C. W. James

He was born in South Wales and entered Nobel's Explosives Co. in 1915. At the end of the first world war he was transferred to the research department of British Dyestuffs Corporation, but after five years he returned to Nobels. Just before the merger he joined the Head Office Development Department, where he remained for twenty years. In 1946 he became personal assistant to Mr. H. E. Jackson, Metals Division chairman, and in 1951 returned to Head Office to work on government contracts.

Mr. James seemed to know everybody and to have been everywhere in the Company. He has an inexhaustible fund of reminiscent stories, which he delivers with true Welsh fluency and much twinkling of the eyes. He used to be a pianist of talent and has used his flair for photography to amass an album of pictures taken by himself of his scores of friends.

ALKALI DIVISION

Children's Visit to the Circus

On 29th December some 140 children from the Northwich district piled into motor coaches and set off for Belle Vue, Manchester. There they formed part of the audience for the matinée of the international circus that appeared for the Christmas season. The children, all between the ages of 5 and 8 years, were the guests of the Alkali Division's Children of the Unemployed (Assistance) Fund—the fund that gave some older Northwich children a week's holiday in North Wales in the summer of last year.

Northwich children with clowns at Belle Vue

The children were most ably looked after by a small band of Alkali Division helpers, who soon had them safely in their seats for the start of the circus. And what an afternoon it was for them! From the first crack of the ringmaster's whip the ring was filled by a breathtaking succession of acts—from performing elephants to footballing dogs, and from jugglers on horseback to a parade of the zoo's baby animals. The clowns, perhaps, won their way to the children's hearts most of all, especially when some of them invaded the party during the interval and the fun raged fast and furious. Those indispensable ingredients of any party—ice cream and sweets—were given to every child and added to their enjoyment.

BILLINGHAM DIVISION

Eating Underground

The cream distemper, red-tiled floor and concealed lighting of the new canteen at Billingham might belong to any modern canteen. Only by the rough-hewn walls and the miners' helmets on the men's heads can you tell that this canteen is 800 ft. underground in the anhydrite mine.

There is nothing like it anywhere else in Britain—this place where the men who work in the underground workshops and

Billingham's new canteen, 800 ft. underground

service the mine vehicles and equipment can have their meals, and where all who work in the mine can see films on safety and other subjects.

One of the galleries in a disused working has been used to make this room—some 18 ft. in width and about three times that in length. In order to close it, openings in the gallery have been bricked up, but most of the walls are left rough-hewn just as they were when they ceased to be worked.

The room is on two levels, the upper one, equipped with chairs and tables, being reached by a short flight of steps. The lower level is where the men can wash the things they use for

meals at sinks along one wall. High up on the end wall of this lower level is the cinema screen, and the projector will be installed in the canteen on the upper level.

Lighting is through two rows of louvres in a false ceiling in the roof. An unusual feature of this ceiling is that above it and along its whole length are two walkways so that the rock roof can be examined regularly, as required by mining regulations.

Other amenities include washplaces and toilets.

The whole project was planned by the mine engineering staff and designed by Chief Engineer's Department, and work began three years ago. It has been carried out by the Services Section of Engineering Works and the men in the mine, with an outside firm to lay the floor tiles and put in the false ceiling.

C.A.C.

P.P. Amphibian fights South Coast Flies

An amphibious DUKW, flying the Plant Protection house flag at its masthead, was used in December to fight the plague of seaweed flies that has invaded Brighton beach. Crawling along at the water's edge, the DUKW sprayed 'Gammexane' suspended in sea water over the flies, while Mr. MacMillan, Minister of Housing and Local Government, watched from the beach.

Plant Protection launches an amphibious attack on seaweed flies at Brighton

Plant Protection was one of a number of concerns invited by the local authorities to demonstrate possible methods of exterminating the flies. Worthing Corporation has already used two tons of 'Gammexane' to good effect on its beaches, and other south coast resorts have used smaller amounts in their battle against the flies.

In January Brighton Corporation invited I.C.I. to co-operate in further, fully controlled experiments with 'Gammexane.'

LIME DIVISION

Tree-planting at Tunstead

On 2nd December a young sycamore tree was planted on the perimeter of Tunstead Quarry overlooking the Great Rocks valley. This "symbolic" tree was the first of 20,000—mainly sycamores and Scots pines—which will be planted during this winter and next. When these trees grow taller they will screen the scars of quarry-working and thus help to preserve the amenities of the Peak District National Park.

Assisted by Graham Thompson, Mr. J. L. S. Steel plants a sycamore at Tunstead Quarry

The ambitious plan, which is an admirable compromise between the interests of industry and amenity, was started by I.C.I. Lime Division to mark Coronation year.

Mr. J. L. S. Steel, Heavy Chemicals Director on the I.C.I. Board, performed the tree-planting ceremony, in which his deputy—Graham Thompson, the youngest fitter apprentice in Lime Division—gave able assistance.

Mr. L. B. Ryder, chairman of Lime Division, explained that the tree about to be planted was the first of many. Three main plantations, each averaging some 3000 trees, would be planted in the winter of 1953–4, and two more, each averaging about 5000 trees, in 1954–5. In addition there would be several subsidiary plantations, including the Coronation Plantation inaugurated today.

Undertaking "an exceedingly acceptable task," Mr. J. L. S. Steel said that one of the greatest developments in quarrying the world had ever seen had been undertaken because it was necessary to keep Britain's industry in the lead. Industry must progress, and in so doing there was some loss in amenity. Much, however, could be done by industry to hide the scars of development by planting trees.

At a luncheon after the ceremony Alderman C. F. White, chairman of the Derbyshire County Council and of the Peak Park Planning Board, pointed out that the Division was planting some six times the number of trees required to comply with its Tunstead planning permission; by this action the breach between the supporters of amenity and the supporters of industry would be narrowed considerably. The expansion of the limestone industry was of primary importance in the employment of people in Derbyshire, who would be much worse off without this material on the western side of the county, and the country much worse off if that industry were ever unnecessarily interfered with. "Derbyshire must be used as it is," said Alderman White; "and that applies to limestone as well as to the fact that there is a Peak District National Park."

NOBEL DIVISION

Board Appointments

Three changes have been made recently in the Division board. Mr. J. E. Lambert becomes a joint managing director, Mr. Alfred Weale joins the board as home sales control director, and Mr. F. G. Lamont as development director.

Mr. J. E. Lambert

Mr. Lambert's service with the Company began in 1911 as a laboratory assistant with Nobel's Explosives Co. at Ardeer. At the outbreak of the first world war he joined the Royal Scots Fusiliers and saw much action in France. His military service was notable. He was mentioned in despatches, was awarded the Croix de Guerre, and became a Chevalier of the Order of Leopold.

He did not return to Ardeer on demobilisation but went to the Royal Technical College, Glasgow, and Glasgow University, where in 1922 he graduated B.Sc. in mining engineering. Thence he went into the coal mines for three years and extended his knowledge further by becoming a certificated mine manager.

Thus when he rejoined the Company in 1925 as a member of the Technical Service Section his knowledge of mining affairs was intimate. In that section he did much important work for the Company and was associated with the intricate blasting operations at the British Aluminium Company's Loch Treig project.

His interest moved from technical service work to manufacture in 1934, and for two years during the second world war he was manager of Ardeer Factory until 1944, when he became personnel manager of the then Explosives Group. A year later Mr. Lambert became personnel director of the Division, a post he held until 1948, when he became production and technical service director.

Mr. Weale joined Nobel Division in 1928 as a physicist. He is a graduate of Liverpool University and was Oliver Lodge Fellow in 1927. After five years in Research Department he moved to production in propulsives and later went to Blasting Department. In 1939 he visited Australia and South Africa on behalf of the Company and on return took over management of a new propulsives section at Ardeer.

Mr. A. Weale

During the war he was manager of the Ministry of Supply agency factory at Powfoot. While there he took part in a mission to Canada and America. When Powfoot Factory closed he joined Operating Department, Glasgow, and worked there until in 1948 he once again went to America on a mission.

Since then he has been development manager and Home Sales manager, and at the beginning of 1953 he was seconded to Scotland and Northern Ireland Region to act as deputy to the late Sir Victor Warren.

Mr. Lamont was manager of Development Department. He is a Belfast man who took his scientific training at Queen's University. After a year's research at Queen's he went to Imperial College, London, where he worked for five years before joining I.C.I. in May 1934.

Mr. F. G. Lamont

After some research work at Ardeer he was transferred to the industrial nitrocellulose plant, and in 1938 he went out to Australia, where he helped to start up a plant for I.C.I.A.N.Z. While in Australia on that job the second world war began, and thereafter he was fully engaged in the Australian emergency developments.

Mr. Lamont returned to Britain and Nobel Division Research Department in 1944 as a member of the Planning Section, which later became Development Department.

Retirement of Joint Managing Director

At the end of December Mr. J. Robinson, a joint managing director of Nobel Division, retired after over 46 years' service with the Company.

Mr. J. Robinson

His had been a most notable career in the explosives industry. On 1st June 1907 as a lad of 15 he secured a job in the head office of Nobel's Explosives Co. in West George Street, Glasgow. After some two years he moved into Foreign Sales, Asian Department.

In Glasgow head office at that time were Mr. Harry McGowan (deputy assistant manager), who was later to become Lord McGowan, Chairman of I.C.I., and Mr. John Rogers, who succeeded Lord McGowan as Chairman. In Foreign Sales Department Mr. Robinson's interest in the export trade of Nobel's Explosives Co. expanded until in 1921, when he moved south to the Nobel Industries head office in London, he was concerned with the entire foreign trade of the company. He was appointed a Division director of the then Explosives Group of I.C.I. in 1935.

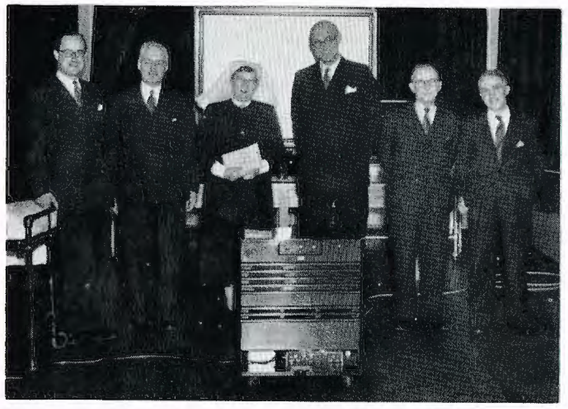
During his service he has seen many changes and helped greatly in the development of explosives trade at home and throughout the world. He made several important journeys abroad on Company affairs. When he first went abroad in 1920 he was only 28 years of age—a responsible mission for a young man.

Two years ago he made a visit to India as a member of a mission which did the preparatory work for the agreement with the Indian government which has just been signed.

During his time with the Company Mr. Robinson has taken part in the business life of Scotland and is a past president of the Kilmarnock Chamber of Industries. Until recently he was also chairman of the Scottish Section of the National Sulphuric Acid Association.

Speeding Convalescence

Patients in the two tuberculosis wards of Ayrshire Central Hospital, Irvine, can now watch television in comfort from



Ardeer representatives with staff members of the hospital to which they had presented TV sets

their beds. Two special TV sets, projecting images on 4 ft. by 3 ft. screens, have been given to them by the men and women of Ardeer Factory, who hope thus to speed the recovery of the patients and make their stay in hospital happier.

The formal presentation of the sets took place in December. At the ceremony Mr. T. McCall, of the Ardeer Works Council Hospital Sub-committee, said how happy he and his colleagues were to give this means of bringing part of the outside everyday world to those who were sick. More, promised Mr. McCall, would yet be done: it was his committee's intention that Ardeer should adopt a ward.

When the sets were switched on by Dr. A. C. Richardson, Ardeer works manager, the chairman of the North Ayrshire hospitals board of management congratulated Mr. McCall, his committee and all the employees at Ardeer for "this excellent example of voluntary spirit." The doctor in charge of the wards said that boredom was the greatest enemy of recovery, and the TV sets would do much to banish boredom.

PLASTICS DIVISION

New Laboratories are among World's Finest

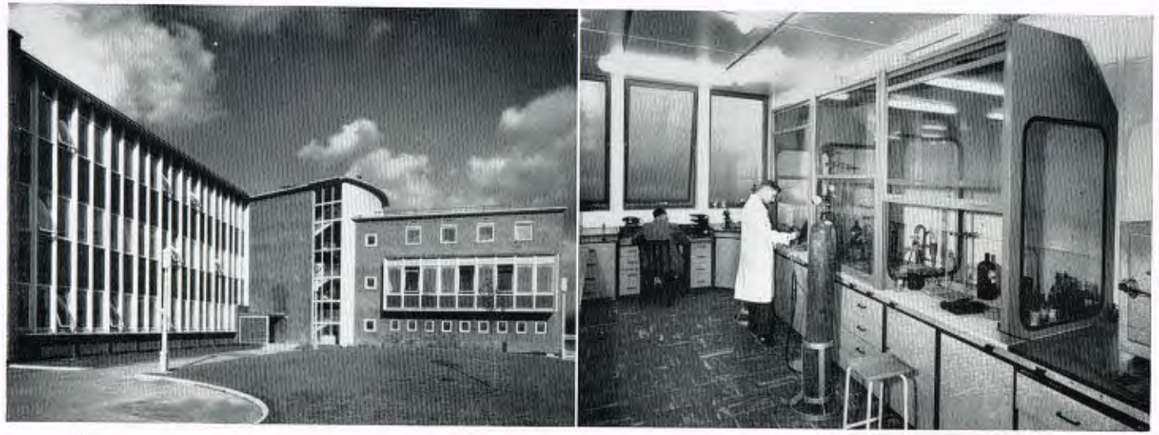
The research activities of the Division, ever since it was formed in 1936, have been carried on in improvised laboratories. But as soon as building restrictions eased after the war plans were laid to build a complete new laboratory block.

On 5th January the new building was officially inaugurated in the presence of Professor Sir Cyril Hinshelwood of Exeter College, Oxford, who was guest of honour; Dr. Alexander Fleck, Chairman of I.C.I.; Dr. R. Holroyd, I.C.I. Research Director; and many distinguished guests from the academic world. The fully-equipped building will cost about £300,000 and is thought to be one of the finest of its kind in the world. During the three days the building was open to visitors nearly 600 people came to see it.

A T-shaped building of modern design, which often catches the attention of travellers on the E. Region railway line, it is capable of extension to four times its present size.

As might be expected, extensive use has been made of plastics in solving design problems in the new building. It is clad externally with demountable 'Holoplast' panels filled with fibreglass, and the laboratories are partitioned by 'Holoplast' panels which can be demounted and moved to change the shape and size of the rooms.

Laboratory bench-tops are of 'Holoplast' veneered with African mahogany and underbench furniture has been faced with Formica. 'Perspex' light fittings and p.v.c. floor tiling have been used throughout the building. The waste-piping is made from rigid p.v.c. and 'Alkathene.'



The new laboratories at Welwyn. Left: A view from the south, showing the administrative wing on the right and part of the laboratory block on the left. Right: One of the laboratories, with fume hoods on top of standard bench units.

An unusual feature of the laboratories is the adoption of what is called "the 4 ft. module." This means that all the wall partitions, laboratory benches and cupboards are built up in 4 ft. units, and can be taken apart and reassembled to form new combinations fitting exactly into the floor area of 176 ft. by 48 ft. By this means a corridor can be transformed into an office, an office into a laboratory, or a laboratory into a corridor. This instant flexibility, devised by an I.C.I. team which helped with the design of the new building, will be of the greatest value in adapting the laboratories to the changing needs of modern research.

SALT DIVISION

Dried Salt in Bulk

One day in November an unusual-looking road vehicle left Weston Point Works. It carried 9 tons of pure dried vacuum salt in bulk—the first consignment of a regular daily bulk delivery to a customer who has made the necessary alterations at his works to take deliveries in this way.

Salt is delivered to customers in bags of various types and sizes supplied by them, which makes handling and filling a complicated business. Large tonnages of undried salt have long been despatched in bulk by road, rail and ship, but bulk delivery of dried salt is quite a new development. The free-running vacuum salt lends itself well to carriage in a hopper, which can be filled and emptied rapidly and makes handling much cheaper.

Salt Division's new vehicle for delivering dried salt in bulk

The hopper is airtight, and is drawn on an articulated trailer by a diesel motor. It can be filled from the plant silos in a matter of minutes and discharged at its destination almost before the driver has time to leave the cab.

Another of the Division's customers is drawing large supplies in bulk from Weston Point in his own fleet of road vehicles of similar design.

WILTON WORKS

Award for Electrical Apprentice

Wilton apprentice Harold Seaton was recently presented with a cash award and book for being the best Electrical Trade Union apprentice of the year in an area covering a large section of the industrial north. Mr. W. Boothby, the E.T.U. area president, made the presentation.

Harold Seaton went to Wilton in January 1950 as an apprentice electrical fitter and has had varied experience, both on the works and in the drawing offices. He gained his national certificate in January 1952 and is now studying for his higher national certificate examination, which he will take in May. He hopes eventually to obtain an endorsement to his higher national certificate which would qualify him for graduate membership of the Institution of Electrical Engineers.

Apart from his work, Harold has only one hobby, old-time dancing. He has gained success in this occupation too, and is vice-chairman of one of the biggest old-time dancing clubs in the district.

A.E. & C.I.

Empirical Test

In the picture above a prospective customer of A.E. & C.I. (East Africa) Ltd. is testing a sample of magenta crystals at the A.E. & C.I. stand at the Royal Agricultural Society of Kenya's annual show.

He is a warrior of the Masai tribe, who use dyestuffs to dye raffia and basketware. This customer tested the sample by squashing it in the palm of his hand and spitting on it; satisfied that this was the colour he wanted, he bought a tin and took it away with him.

The man holding the tin is Mr. D. J. Perry, the East African company's industrial sales manager, and the picture was taken by Mr. D. R. Scorer, the company's managing director.

I.C.I. (CHINA)

Board Appointments

Three new directors have been appointed to the board of I.C.I. (China). They are Mr. C. A. Wright, Mr. W. C. Bowling and Mr. R. J. Parsons.

Mr. Wright has been with the Company since 1930. He was stationed in Shanghai until 1941, when he was appointed district manager, Hankow.

When the Pacific war broke out he was unable to leave China and was interned with his wife by the enemy at a civil assembly centre in Shanghai. In a nearby military internment camp his brother and Mr. H. J. Collar, C.B.E., late vice-chairman of I.C.I. (China), were the official representatives of all the internees. During his internment Mr. Wright and his wife organised language classes for internees.

Mr. Wright returned to Shanghai after the war as sales manager, and later became sales manager at Hong Kong. He is a better-than-average tennis player and before the war played tennis for the Shanghai Cricket Club; on more than one occasion he turned out for international walking matches.

Mr. Bowling joined Brunner, Mond & Co. in 1922 and was posted to various outports before being appointed divisional manager, Hankow, in 1934, and divisional manager, Tientsin, in 1939. At the outbreak of the Pacific war he was dyestuffs sales manager in Shanghai.

Mr. Bowling was fortunate enough to be one of a number of internees exchanged by the Japanese, and by way of Lourenço Marques and Durban he reached India and enlisted in the Indian Army. There he was one of a handful of men who reorganised the medical stores organisation and earned high praise from General Auchinleck.

He was demobilised with the rank of Lieutenant-Colonel and returned direct to Shanghai for a month before going to Tientsin to reopen the I.C.I. office. He was appointed assistant secretary in Shanghai in 1945 and Shanghai office manager six years later.

Before the war Mr. Bowling was the youngest man ever to have been chairman of the British Chamber of Commerce in Hankow, and he was also chairman of the chambers at Amoy and Tientsin. Mr. Bowling is a keen golfer who has had much success in China competitions. He has a daughter at school in England, and another who is married to the Belgian air attaché in London.

Mr. Parsons joined I.C.I. (China) in 1928 and after service at various outports became district manager, Chefoo, in 1934. Later he was transferred to Dyestuffs Sales in Shanghai.

He had the good fortune to be on leave in the U.S.A. (his wife is American) when the Pacific war broke out, and he went up to Canada and joined the Royal Canadian Air Force. His knowledge of the Chinese and Japanese languages fitted him for intelligence work, and he spent the war in the cryptographic division of the R.C.A.F. in Ottawa.

Mr. Parsons was a notable swimmer in his younger days and swam for the rowing club at Shanghai. During the troubles in 1937 he was a member of the Mih Ho Loong Rifles (A Company) of the Shanghai Volunteer Defence Corps.

Mrs. A. V. Farmer

The many friends of Mr. A. V. Farmer, chairman of I.C.I. (China), will have heard with deep sorrow of the death of Mrs. Farmer in Hong Kong on 6th December.

Kay Farmer, as those who had the privilege of meeting her, whether in China, in Hong Kong or at home found out, had the rare faculty of making people who had only just met her feel that they were old and welcome friends. Among the staff of I.C.I. (China), both British and Chinese, she was held in great affection and was regarded more as a member of the family than as a mere friend. She was untiring in her help to the staff and their families, and although warned that she must take greater care of her health she insisted on returning to Hong Kong in April 1952 in order to support her husband in his work.

'TERYLENE' COUNCIL

Deep Freeze

This picture was taken recently in one of London's deep-freeze warehouses where two models were acting as "guinea-pigs" in tests on the weather resistance of the new 'Terylene' furleen coats. During the tests newsreel cameramen took films, which will be shown on American TV as well as in hundreds of cinemas in this country.

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OUR NEXT ISSUE

Kevin FitzGerald, recently appointed publicity chief for Central Agricultural Control and known to many people both as a writer of detective stories and as a commentator after the 6 o'clock news, writes the lead in our March *Magazine*. The title of his article is "Nearly as much meat as you like" and his theme is that we owe the present near-plentiful supplies very largely to the success of the I.C.I. campaign to persuade farmers to grow more and better grass by using nitrogen in the shape of sulphate of ammonia or 'Nitro-Chalk.'

Our colour feature is on the growing of irises. There are some fine illustrations. The author is N. P. Harvey, known to gardeners for his successful book on roses published two years ago. This article is followed by a story on the development of show-jumping in England, written by a member of General Chemicals Division's Chance and Hunt works, who is himself a keen rider and a qualified show-jumping judge. Lastly, Miss E. M. Carter from Wilton Works contributes the story of her holiday in Spain. This was a winner in the Holiday Articles competition.

Fourteen Days Hard

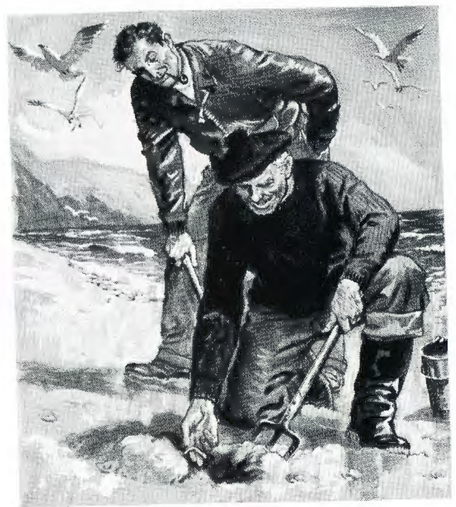
By William Russell (Dyestuffs Division)

Illustrated by Clive Uppton

KING James I described the county of Fife as "a beggar's mantle fringed with gold," and until recent years, when the coal-pits on the coast began to spew out their waste and desecrate the golden fringe, no description could have been more apt. Times have changed, and we must needs accept, instead of the once sandy seashore, a coastline made bleak and ugly by countless tons of slag —a crêpe bandage of mourning for days that are gone.

Just to the west of Largo Bay lies the coastal town of Buckhaven, within living memory a fishing village of blue-jerseyed, bearded men and beshawled women. But now the "auld toon" is falling to pieces. It is surrounded and all but buried in the fast-moving ribbon development.

The men have forsaken their yawls to dig coal, and their women would not seem out of place in any market square from John o' Groats to Land's End. The lifeboat station is a thing of the past, the harbour is derelict, the morning fish-market is no more . . . but wait! The instincts of ten generations of fishermen cannot be eradicated within the space of a single lifetime.



For five or ten minutes I watched Jock

Upwards of twenty small boats, with names such as "Maggie Deas" and "Nell Burgon," still grace the foreshore. They are maintained and plied as a hobby by the grandsons of men who knew no trade other than that of the fisher. These modern "playtime fishermen" are mainly miners, with an odd foundryman or bricklayer or plumber, They work hard, and their hobby of small-boat inshore fishing is no activity for a weakling.

As a rule, too, they drink hard. Their capacity for draught beer is unbelievable. They play darts and dominoes in the pubs. They bet on horses in complicated permutations termed "three-cross tanner Irish" and "double-stake bounces," to give two examples. Theirs is a simple way of life, with neither knowledge of nor time for complexes or inhibitions. A way of life which I shared for two amazing and enlightening weeks of the summer just gone.

I went there, in the first instance, with a purpose. I had been ill, and the east coast air, sharp and bracing, coupled with the tang of the sea, was just what the doctor ordered. On the morning of my arrival I went out with no specific object in view: to cast around, to get my bearings and the feel of my new surroundings.

At the bar of the Rising Sun tavern I met one of the "sma' boat" enthusiasts. In a matter of minutes he was warming to his favourite subject, and an hour later I had succeeded in inducing him to invite me on a fishing trip.

One impression of that first meeting with Jock Graham will remain with me: his air of surprise and commiseration when I refused a fourth pint of heavy draught beer. "Are ye no' weel?" he enquired anxiously; "or"—hesitantly—"maybe ye'd fancy a nip?" Diffidently I mentioned a gin and it. "A woman's drink, that," he said, disparagingly, and to the barman: "Wull, bring this bloke a nip o' whisky."

That was that. I learned that men drank draught beer and that an occasional glass of whisky or rum was the only alternative. I learned also that, in their joyous little world, shaving the beard more than twice a week was considered dandified, and that the well-dressed man wore old trousers or dungarees, a jersey, and a jacket which could be donned or doffed according to the exigences of the situation or the job in hand. Its main asset was its pockets, which held fish-hooks, lines, sinkers, cigarettes, or pipe

and matches. Footwear was, of necessity, heavy boots. Headgear, if existent at all, was a peaked "bunnet."

To impart the atmosphere of my holiday in a brief article is a difficult assignment. I will attempt the task by citing instances which can be taken as exemplifying the whole piece.

On my first time out in the boat I was for the most part a spectator. Having no equipment, I watched the others (Jock and his regular "butty," Rob Wilson) haul in a score of plump whiting, a few codlings, and from a sand-bank over which we loitered for a considerable time, some fine flounders and plaice. This was an average catch for a three- or four-hour trip.

The "up-toon" fishmonger gave a fair price for the catch, which was sure of a ready market. The money was exchanged for beer, cigarettes, and bets on the "cuddies." Pin-money, if you like, and wholly outside the domestic budget. The financial returns were a mere side issue of that engrossing activity, "the fishin'."

The bait used by Jock and his kind is usually the lug-worm, which they dig up from the sandy reaches of the nearby Leven beach, as yet free from the scourge of the slag from the pit bings, despoiler of the former glory of adjacent Buckhaven and Wemyss. I found digging for lug quite a pleasant, if rather an arduous, pastime. The fact that you are seeking prey, even if it is only a fat, four-inch worm, satisfies the hunter instinct which is dormant in most men.

On the morning after that first taste of sea fishing I was on Leven beach along with Jock at 6 a.m., when the tide was at full ebb. I had my instructions and a short-shafted, three-pronged fork. For five or ten minutes I watched Jock at work. The evidence of the whereabouts of the lug, which is usually found six to twelve inches deep in the sand, is the cast which it leaves on the surface. The method of procedure does not vary.

Starting six inches to seaward of the cast, you dig one spit deep and work back to the cast. The first sign is a track or hole (the lugworm's burrow) which the fork uncovers. You follow the track till it dips vertically, showing where the bait is located. Then down goes your fork, down deep as you can, and among the sand which you bring up is the lugworm—a fat, succulent creature with a distinct difference in diameter a third of the way along its length which divides the "head" from the "tail." As you become adept you have few failures and you cease to undo the good work by cutting the worm with the fork—a failing of beginners which is almost unforgivable in the expert.

On that first attempt my bag was perhaps a score of worms, while Jock methodically filled a half-gallon can. Before my holiday was over I was digging one to his two—to his satisfaction and my own intense gratification.

The fishing expeditions were, no less to Jock and Rob than to me, fascinating. Apart from the intense satisfaction of catching a variety of sea fish, apart from the occasional excitement of a "big 'un," apart from the unbounded joy of once getting right into the centre of a shoal of mackerel, apart altogether from the thrill of the chase and the prize of the kill, there was priceless experience that was new to me.

The calm stillness and the whispering sea and the champagne air of early morning—really early morning, when all things past are wiped out and everything is new again. The feeling of being really alive as the cockle of a boat—fantastically fragile to an introspective landlubber—swung and bobbed, dipped and rolled on the uneasy surface of eight fathoms of hungry sea. The sting of mixed rain and spume whipping the cheek with a hundred little lashes when a minor squall blew up from nowhere. The aching joy which complaining muscles give to a tiring brain as you pull the boat back to the pier, home to the stable element, the job done. The irresistible compulsion to eat and drink engendered by hard work in the clear air. And not least the supreme satisfaction of immediate deep sleep, when the couch is scarce attained before oblivion comes to tone the body and refresh the mind during a night which goes in a wink, and there you are, ready, aye, eager, to repeat the day, again and again.

The excitement occasioned to Jock and Rob on that afternoon when we encountered the school of mackerel was a joy to behold.

We had pulled out just after noon with no idea other than that of "the recipe as before" and had hovered for an hour over the feeding bank, hauling in a dozen flounders. We were making inshore towards a known "codling rock" when Jock pulled at Rob's shoulder and said fiercely what sounded to me like "the saundles." Where he was pointing I could see a thousand glittering points of white on the surface of the water, roughly a hundred yards away and moving in our direction. I could hear a swishing sound like rain falling on a roof above your head.

Plying an oar apiece, Jock and Rob made expert pace to meet the "saundles." These, as I gathered later, were sand-eels, myriads of small, shining, white-bellied fish, the favourite prey of that toothsome fish, the mackerel. Before I knew what was going on we were among them. No hook or line or bait were required here. I have seen men work laboriously with rod, reel and jigger for mackerel. But we were among them. The sea was alive. The sand-eels were frantic, hunted. The mackerel were frantic, hunting. The whole story of the universal law of the survival of the fittest was being enacted in all its relentless savagery, and we, in our little boat, were right in the centre of the turmoil.

With a landing-net which was always carried in the boat

. . . We scooped the lashing, leaping mackerel in, a score at a time, till we had to call a halt . . .

we scooped the lashing, leaping mackerel in, a score at a time, till we had to call a halt lest we should scuttle the boat. We rowed home and celebrated with beer, and told our story a hundred times to the admiring and envious habitués of the Rising Sun tavern.

The days came and went, weaving the same pattern of never-diminishing delight. There came the last time on the sands with the fork and the bait-can; the final trip in the boat and the ultimate amusing haggling for an extra bob with our fishmonger. We played darts and emptied our pint pots in the bar of the Rising Sun.

From another part of the premises came the sound of an out-of-tune piano and of untrained voices raised in disharmony that was not altogether unpleasant. The Saturday-night binge was in full swing. Tomorrow these men would lie in bed, go to church, play cards or pitch and toss, visit relations for Sunday tea, do a bit of gardening, go off on a day trip—each one according to his wont. I would pack my scanty bag and go back where I belonged, with, if no real regrets, then certainly a decided reluctance.

During those fourteen days I never deliberately listened to the radio, read a newspaper or visited a cinema or other place of entertainment except the "local," and I had no regrets. My grandfather in his own time might have done exactly as I did if (as is very unlikely) he could have had a fortnight's leave of absence.

If, next year, I should fly to Paris or Rome, live sumptuously in the best hotels, and have all that science and modern civilisation can put at my disposal, I doubt very much whether it would make such a deep impression, whether it could leave an aftermath of sense of fulfilment such as did my short sojourn with the spare-time fishers of the coast of Fife.

"Please, sir, it wasn't me!"

Photo by John H. Stone